

 Georgia Technology Authority	<b>Georgia Technology Authority</b>	
<b>Title:</b>	<b>Radio Communications – Public Safety</b>	
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<b>POC for Changes:</b>	Information Technology Planning Office	
<b>Synopsis:</b>	Public safety radio communications systems design standard	

## PURPOSE

To prescribe an enterprise Public Safety Radio Services standard for the development and implementation of a statewide radio communications system that will provide interoperability among state and local government Public Safety agencies. The goal is to provide the radio communications capabilities for Public Safety government agencies to perform their missions in any given situation.

## SCOPE

This standard is applicable to Public Safety agencies to provide interoperability communications by voice or data with each other in various environments and scenarios under Homeland Security. Public Safety agencies are those organizations that have the responsibility of protecting life and property such as police, fire, emergency medical, emergency management and other organizations that enforce state or local government laws. This standard is optional for non-public safety agencies. All Agencies as that term is defined in O.C.G.A. Section 50-25-1(b)(1).

## STANDARD

1. The enterprise public safety radio service shall meet all applicable ANSI/TIA/EIA-102 standards. This includes both infrastructure and subscriber equipment. Specific ANSI/TIA/EIA 102 standards include:

### OSI Physical Layer and Data Link Layer

ANSI/TIA/EIA 102.BAAA, *Project 25 FDMA Common Air Interface*, May 1998. The objective of the common air interface is to ensure that subscriber unit equipment that conforms to this document will be interoperable at the Physical Layer and Data Link Layer with subscriber

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unit equipment from different manufacturers, and compatible with radio systems for different agencies.

### **Analog to Digital Conversion**

ANSI/TIA/EIA 102.BABA, *Project 25 Vocoder Description*, May 1998. This document describes the functional requirements for the transmission and reception of voice information using the digital communication media described in the Common Air Interface, ANSI/TIA/EIA102.BAAA. This standard is specifically intended to define the conversion of voice from an analog representation to a digital representation that consists of a net BIT rate of 4.4 kbps for voice information, and a gross BIT rate of 7.2 kbps after error control coding.

### **Modulation and Demodulation**

ANSI/TIA 102.CAAA-A, *Digital C4FM/CQPSK Transceiver Measurements Methods*, November 2002. This document standardizes parameter titles, definitions, the test conditions, and the methods of measurement used to ascertain the performance of Project 25 transceiver equipment within the scope of this standard, and make possible a meaningful comparison of the results of measurements made by different observers and on different equipment.

### **Performance Measures**

ANSI/TIA 102.CAAB-A, *Land Mobile Radio Transceiver Performance. Recommendations – Project 25 – Digital Radio Technology, C4FM/CQPSK Modulation*, September 2002. This document establishes minimum performance specifications for Project 25 transceiver equipment when measured according to ANSI/TIA/EIA102.CAAA.

### **Trunking**

ANSI/TIA 102.AABB, *Project 25 Trunking Control Channel Formats*, May 2002. This document defines the format of trunking control channel transmission for Project 25 systems. The formats are compatible with the Common Air Interface defined by ANSI/TIA/EIA102.BAAA and both encrypted and non-encrypted formats are defined.

ANSI/TIA/EIA 102.AABC, *Project 25 Trunking Control Channel Messages*, May 2000. (Includes *Addendum 1* dated September 2001 and *Addendum* dated December 2002). This document defines all messages for Project 25 Trunking. All messages are constructed from formats further identified by ANSI/TIA/ EIA102.AABB Trunking Control Channel Formats.

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## Linking

TSB102.AABF, *APCO Project 25 Link Control Word Formats and Messages*, May 1996. This document defines all link control words for voice transmissions on Project 25 systems. This will include both trunking and conventional.

## Integration

TSB102.BACC, *Inter-RF Subsystem Interface Overview*, December 1996. This document provides a high level overview of the Project 25 ISSI. It summarizes the protocol and message structure, mobility management, and intervening network adaptation.

ANSI/TIA/EIA 102.BADA, *Telephone Interconnect Requirements and Definitions (Voice Service)*, March 2000. This document defines the interface between an RF-Subsystem and a public or private switched telephone network (PSTN).

ANSI/TIA/EIA 102.BAEB, *Project 25 Packet Data Specification*, March 2000. (Includes *Addendum 1* dated October 2001 and *Addendum 2* dated August 2002). This specification serves to define the detailed interfaces, protocols, and procedures involved in interfacing with a data capable Project 25 standard radio unit via the standard mobile data peripheral interface, and end-system interface. Defined are packet services, in all 3 configurations: radio-radio, radio-repeater, and radio-FNE (Fixed Network Equipment), supported by point-to-point radio data peripheral interfaces. The data services mapping to 25 CAI formats are defined, which may be provided across conventional or trunked service channels.

ANSI/TIA/EIA 102.BAEC, *Project 25 Circuit Data Specification*, June 2000. This specification serves to define the detailed interfaces, protocols, and procedures involved in interfacing with a data capable Project 25 standard radio unit via the standard mobile data peripheral interface, and (optionally) a Project 25 standard FNE (Fixed Network Equipment), data end-system interface. Defined are circuit services, in all 3 configurations: radio-radio, radio-repeater, and radio-FNE (Fixed Network Equipment), supported by point-to-point radio data peripheral interfaces.

ANSI/TIA/EIA 102.BAEE, *Project 25 Radio Control Protocol (RCP)*, March 2000. (Includes *Addendum 1* dated August 2002). This document defines the Radio Control Protocol (RAP) for use in Project 25 digital radio systems for packet data communications services.

TSB102.BAFA-A, *Project 25 Network Management Interface*, July 1999. This document defines the interface between one or more RF-Subsystems and an attached network management Manager or other interconnect network management system.

## Encryption

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ANSI/TIA/EIA 102.AAAA-A, *Project 25 DES Encryption Protocol*, February 2001. This document defines the mode of operation of DES encryption and decryption in a manner compatible with information transfer through a Project 25 system, especially the Common Air Interface. The document describes both voice and data encryption procedures.

ANSI/TIA/EIA 102.AAAD, *Project 25 Block Encryption Protocol*, July 2002. This standard describes the encryption protocol for land mobile radios meeting the Project 25 requirements. For system implementations, such as Trunking, Data, etc. this document provides only the appropriate requirements to ensure over-the-air encryption compatibility, rather than all the requisite specification details for such implementations.

ANSI/TIA/EIA 102.AACA, *Project 25 Digital Radio Over-the-Air-Rekeying (OTAR) Protocol*, April 2001. (Includes *Addendum 1* dated November 2002). This document defines the message and basic procedures for providing OTAR (Over-The-Air-Rekeying) and related key management services. It describes methods of encrypting and sending the encryption keys and other related key management messages through the Common Air Interfacing such a way that they are protected from disclosure, and in some cases unauthorized modification.

2. Subscriber equipment shall have the capability of operating on existing 800 MHz trunked radio communications systems either operating in a trunked mode and/or conventional mode (mutual aid channels).
3. The existing systems that are incompatible will be capable of interoperability through cross-band interface devices. The device purchased subject to technical review by GTA in accordance with Telecommunications Technology Review Standard, ENT-09-001–STD.

## **AUTHORITY**

1. O.C.G.A. 50-25-1 *et seq.*
2. Federal Emergency Management Agency – Letter from Ronald E. Miller, Assistant Director, Information Technology Services Directorate, dated August 2, 2002
3. CFR 47 – Title 47 of the Code of Federal Regulations – Federal Communications Commission (Part 90 – Private Land Mobile Radio Services (PLMRS))

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## EXCEPTIONS

Exceptions to the standard will be submitted in accordance with the Georgia Technology Authority Exception Policy.

## GUIDELINES

To assure radio communications interoperability, Public Safety entities prior to designing/implementing a radio communications system should coordinate with adjacent or other Public Safety organizations which they will need to intercommunicate with during emergency situations.

All enterprise public safety radio services should be in compliance with CFR 47 (FCC Part 90 Rules and Regulations) as to frequency assignments, coordination and radio station licensing.

## TERMS and DEFINITIONS

1. ANSI – American National Standards Institute
2. TIA- Telecommunications Industry Association
3. EIA – Electronics Industries Alliance
4. Interoperability - The ability of multi vendor devices to work together using a common set of protocols. For  
Two-Way Radio, the ability for users to intercommunicate directly subscriber-radio to subscriber-radio regardless of the frequency band and/or protocol without intervention of a dispatcher or other manual patches being required.
5. Project 25 -The Project 25 process developed the 102 series of detailed technical specifications for digital, land mobile radio communications systems. The process was led by a users' Steering Committee, and the standardization work was done by the Telecommunications Industry Association in accordance with their standards process as defined in their engineering manual. The result is a suite of ANSI/EIA/TIA standards, TIA/EIA Interim Standards, and TIA Telecommunications System Bulletins.
6. Public Safety Radio Services – means those radio services as defined in O.C.G.A Section 50-25-1 (b)(10).

Note: PSG number administratively changed from S-04-005.02 on September 1, 2008.

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